

What is claimed is:

1. A method of monitoring during real time operation the soot accumulation in diesel engine lubricant comprising:
  - (a) disposing a pair of electrodes in the engine lubricant and applying an alternating voltage to the electrode at different frequencies over a selected range and measuring the current magnitude and phase angle at each frequency and computing the resistive and reactive component of the impedance for each current measurement;
  - (b) comparing the reactive component as a function of the resistive component of impedance and determining the location of the center of semicircular curvature between the origin and the low frequency minimum occurring value of reactive impedance;
  - (c) delaying a specified time interval repeating steps a, b and c computing the angle of depression from the origin to the center of curvature.
  - (d) determining the percentage of soot from one of (i) a comparison with known values of percentage soot versus depression angle (ii) a known relationship between percentage soot and depression angle; and,
  - (e) providing an electrical signal indicative of soot reaching a selected level of concentration.
2. The method defined in claim 1, wherein said step of providing an electrical signal includes providing a signal which is indicative of soot concentration within a range of about 0 - 9.6%.
3. The method defined in claim 1, wherein said step of applying an alternating voltage includes applying a voltage over the frequency range associated with bulk fluid impedance measurements.

4. The method defined in claim 1, wherein said step of comparing includes graphing a complex impedance plane (Nyquist) plot..
5. The method defined in claim 1, wherein said step of comparing includes graphing a complex impedance plane (Nyquist) plot and determining the locus of the center of curvature of the Nyquist plot between the origin and the minimum reactance value.
6. The method defined in claim 1, wherein said step of applying an alternating voltage includes applying an alternating voltage and measuring current and phase angle at frequencies over the range of about 1 - 10,000 Hertz.
7. The method defined in claim 1, wherein said step of comparing includes using computational means.